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EXAMINER	
ONEILL, KARIE AMBER	

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1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/089,377	JAFFREY ET AL.	
	Examiner	Art Unit	
	Karie O'Neill	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32 and 51-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32, 51-57* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Applicant's amendment filed on October 23, 2008, was received. Claim 1 has been amended. Claims 33-50 and 58-65 have been cancelled. Therefore, Claims 1-32 and 51-57 are pending in this office action.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on July 17, 2008.

Claim Rejections - 35 USC § 112

3. The rejection of claims 1-32 and 51-57 under 35 U.S.C. 112, second paragraph, for failing to particularly point out and distinctly claim what a ceramic-"type" anode layer is, has been overcome based on the amendment to Claim 1.

4. The rejection of claims 1-32 and 51-57 under 35 U.S.C. 112, second paragraph, for failing to particularly point out and distinctly claim what a "green material" is, has been overcome based on the description given on page 7 of the Remarks dated October 23, 2008.

Claim Rejections - 35 USC § 103

5. Claims 1-8, 17-21,51-57 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dodge (WO 96/04690) in view of Singh et al. (US 4,894,297.) The rejection of is maintained.

With regard to Claim 1, Dodge discloses in Figures 3a, 3b, 4a, 4b, 5a, 5b, 6a and 6b, a tubular fuel cell assembly for use with fuel gas comprising an anode side (916) defining a tubular passage adapted for passage of the fuel gas, the anode side including an anode layer and an anode-side current collector (910) in electrical contact with the anode layer, an electrolyte layer (918) on a radially outer surface of the anode layer, a cathode layer (920) on a radially outer surface of the electrolyte layer, and a cathode- side current collector (922) on the cathode layer, the anode-side current collector including a preformed tubular metallic structure, called a hollow member having through holes (912) and is gas permeable to permit fuel gas in the passage to contact the anode layer, the anode layer being formed on the tubular metallic structure so that the tubular metallic structure is at least partly embedded in the anode layer and reinforces the anode layer (page 11, lines 13-43 and page 12, lines 1- 24). Dodge does not disclose wherein a surface of the tubular metallic structure is formed of one of Ni and Ni alloy.

The term "preformed" is functional language that imparts intended use to the structural features of the product. Therefore, while the intended use language of the claim has been considered, it is not given patentable weight because it is directed to a process and not directed to the structural features of the product. While features of an apparatus may be recited either structurally or functionally, claims directed to an apparatus must be distinguished from the prior art in terms of structure rather than function. See MPEP 2111. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the

claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. See MPEP 2113.

Singh et al. discloses in Figure 1, a tubular solid oxide fuel cell (10) in which the cathode (14) is deposited onto a support tube (12), the solid oxide electrolyte (16) is deposited onto the cathode, the anode (18) is deposited onto the solid oxide electrolyte. Singh et al. discloses a nickel layer (22) deposited over an outside interconnection (20) and electrical interconnection layers (24, 26,28) made of nickel fibers deposited on the outermost layer of the tubular fuel cell, acting as current collectors (column 4 lines 64-67). The arrangement of the solid oxide fuel cell of Singh et al. has been reversed into an inverted cell structure from that of the fuel cell of Dodge, however, the components are the same and perform the same function even in the reverse order. Therefore, at the time of the invention it would have been obvious to use a nickel metallic structure as the anode side current collector of the tubular fuel cell of Dodge, because Singh et al. teaches a nickel porous felt enhances electrical connections between fuel cells (column 4 lines 27-47).

With regard to Claims 2-5, Dodge discloses in Figures 3a-b and 4a-b, wherein the tubular metallic structure (910) is at least substantially completely embedded in the anode layer, wherein the tubular metallic structure has surface formations thereon which project radially outwardly into the anode layer (916), the formations that project outwardly are formed by the outward portions of the grooves (914). Dodge discloses wherein the tubular metallic structure also has concave formations or grooves (914) on a radially outer surface thereof into which the anode layer extends, and the tubular

metallic structure extends substantially the full length of the tubular passage (page 11, lines 13-47).

With regard to Claims 6-8, 18, 20 and 21, Singh et al. discloses the tubular metallic structure of a porous nickel felt (which can be considered mesh), made from nickel fibers (which can be considered thread) has a thickness of about 100 micrometers (column 4 lines 40-49), the anode layer is a nickel cermet made of nickel particles embedded in an oxide skeleton having a thickness of about 100 micrometers (column 4 lines 27-39), the electrolyte layer having a thickness of about 1 to 100 micrometers (column 4 lines 9-12) and the cathode layer having a thickness of approximately 0.05 millimeters to 1.5 millimeters thick (column 3 lines 61-66). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use these anode, electrolyte and cathode thickness with the fuel cell of Dodge, because Singh et al. teaches exemplary thicknesses for the preferred configuration of a tubular solid oxide fuel cell.

With regard to Claims 17 and 19, Dodge discloses the anode layer is formed on the anode side current collector and the electrolyte material is formed on the anode layer (pages 11 and 12). However, the phrases "an extruded layer formed on the tubular metallic structure of the anode-side current collector" and " provided on the anode layer by a method selected from slurry coating or otherwise depositing the electrolyte layer on the anode layer, extrusion on to the anode layer and co-extrusion with the material of the anode layer" are process steps in product-by-process claims. Product-by-process claims are not limited to the manipulations of the recited steps, only the structure

implied by the steps. "Even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." MPEP 2113. Since Dodge and Singh's tubular solid oxide fuel cell is the same as that of the Applicant's, Applicant's process is not given patentable weight in these claims.

With regard to Claims 51, 54 and 56, Dodge discloses in Figures 12 and 13, a fuel cell bundle comprising a plurality of tubular fuel cells, each mechanically connected to one or more adjacent tubular fuel cell assemblies through rigid links (972) which provide an electrical connection between adjacent tubular fuel cell assemblies (page 17 lines 41-43 and page 19 lines 13-21).

With regard to Claims 52, 53, 55 and 57, Singh et al. discloses in Figure 2, a fuel cell bundle with mechanical felt connections (24) along the vertical rows (32) and in parallel along the horizontal rows (34), the final connection being made to a conductive metal plate or bus bar (37). The mechanical felt connection is continuous along the length of each of the fuel cell assemblies and intermittent along the length of the bundle of the fuel cell assemblies (column 5 lines 1-9). The connection is also a flexible connection since it made from a felt that also is made of the same material as the anode side current collector as well as rigid because it includes a nickel bus bar (column 7 lines 34-36). Because Singh et al. is made in the reverse form as that of Dodge, the

mechanical connection being made from the same material as the anode side current collector in Singh et al. would be the same as the mechanical connection being made from the same material as the cathode side current collector in Dodge. Therefore, at the time of the invention, it would have been obvious to have continuous mechanical connections along the length of the tubular fuel cell assembly, as well as intermittent connections along the length of the tubular fuel cell assemblies of Dodge, because Singh et al. teaches maintaining an open cell circuit voltage, good cell resistance and gas composition along the fuel cell assembly length with the placement of mechanical connectors.

6. The rejection of Claims 9-16 under 35 U.S.C. 103(a) as being unpatentable over Dodge (WO 96/04690) in view of Singh et al. (US 4,894,297), as applied to Claims 1-8, 17-21,51-57 above, and in further view of Will (US 4,347,429), are maintained.

Dodge and Singh et al. disclose the tubular fuel cell assembly in paragraph 5 above, but do not disclose wherein the support tube is formed of nickel or nickel alloy, comprises a substrate of heat resistant, heat conducting metal and a nickel or nickel alloy surface layer, wherein the substrate is steel, the surface layer is a foil or is coated on the substrate, wherein a thermally conductive tube liner is provided in the passage for r conducting heat therefrom, and the tube liner is tubular.

With regard to Claims 9-14, Will discloses in Figure 5, a perforated metallic substrate made of a rigid steel or stainless steel, coated with nickel (column 3 lines 13-22). Therefore, at the time of the invention it would have been obvious to one of

ordinary skill in the art to use a metal coated with nickel as the support tube of the assembly of Dodge and Singh et al., because Will teaches these materials being electrochemically reversibly oxidized and reduced in response to AC current flow therethrough (column 2 lines 53-55).

With regard to Claims 15-16, Will discloses wherein a thermally conductive tube liner is provided in the passage which defines a space to which the electrolyte is heated by conventional means (column 2 lines 43-47) and the liner is tubular or cylindrical (column 4 lines 1-34). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use a tube liner with the assembly of Dodge and Singh et al., because Will teaches using this structure of the mechanical strength and current carrying capacity do not require a thicker or solid support tube (column 4 lines 1-9).

7. Claims 22-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dodge (WO 96/04690) in view of Singh et al. (US 4,894,297), as applied to Claims 1-8, 17-21,51-57 above, and in further view of Isenberg (EP 0055016 A1). The rejection is maintained.

Dodge and Singh et al. disclose the tubular fuel cell assembly in paragraph 5 above, but do not disclose wherein the cathode layer is discontinuous along the length of the assembly to provide a plurality of longitudinally spaced cathode portions and at least some of the portions are electrically connected in series and the cathode layer is discontinuous around the assembly. Dodge and Singh et al. do not disclose wherein the

discontinuity around the assembly is provided by at least one longitudinally-extending gap in the cathode layer and wherein the series connection of said longitudinally spaced cathode portions is provided by a strip of electrically conductive material in said gap and the strip is formed of that same material as the cathode current collector.

With regard to Claims 22-25, Isenberg discloses a solid oxide fuel cell in Figure 4, wherein the cathode layer (when the system has been reversed into an inverted cell structure) is discontinuous along the length of the assembly to provide a plurality of longitudinally spaced cathode portions (60) and the spaced portions are electrically connected in series by an elongated metal felt, metal strip or metallized inlay which acts as a current collector (page 4 lines 6-23). Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to use discontinuous cathode portions electrically connected in series for the assembly of Dodge and Singh et al., because Isenberg teaches that the segmentation alleviates circulating currents within the electrodes which tend to result from simultaneous exposure to rich and depleted reactants over the electrode surface (page 8 lines 11-28).

With regard to Claims 26 and 27, Isenberg discloses in Figure 2, wherein the cathode layer (when the system has been reversed into an inverted cell structure) is discontinuous around the assembly and the discontinuity is provided by at least one longitudinally extending gap in the cathode layer and wherein the series connection is provided by a strip of electrically conductive material in said gap, called an interconnection (34) and comprised of the same material as the anode, but when the cell is in an inverted structure would be coated in the cathode material (page 7 lines 16-

34). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a discontinuous cathode layer with an electrically conducting strip with the assembly of Dodge and Singh et al., because Isenberg teaches using an electrically conductive material which remains conductive in both an oxidant and fuel environment, provides a gas-tight interconnection between the cells (page 7 lines 6-13) and insures a large contact surface to avoid potential structural damage to the outer electrodes (page 9 lines 1-3).

8. Claims 28-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dodge (WO 96/04690) in view of Singh et al. (US 4,894,297), as applied to Claims 1-8, 17-21,51-57 above, and in further view of Sammes (WO 99/17390). The rejection is maintained.

Dodge and Singh et al. disclose the tubular fuel cell assembly in paragraph 5 above, but do not disclose wherein the cathode side current collector comprises a metallic layer of noble metal or noble metal alloy which is adapted to permit oxygen containing gas around the assembly to contact the cathode layer, and wherein the noble metal is silver.

Sammes discloses a tubular solid oxide fuel cell wherein the cathode-side current collector is made of a silver wire or silver paste and is adapted to permit oxygen containing gas around the assembly to contact the cathode layer (page 12 lines 9-10 and 12-13). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a noble metal, such as silver, for the cathode current

collector of Dodge and Singh et al., because Sammes teaches that silver is a good conductor of electricity.

9. Claims 30-32 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dodge (WO 96/04690) in view of Singh et al. (US 4,894,297)), as applied to Claims 1-8, 17-21,51-57 above, and in further view of Goodenough (US 6,004,688). The rejection is maintained.

Dodge and Singh et al. disclose the tubular fuel cell assembly in paragraph 5 above, but do not disclose wherein the cathode-side current collector comprises at least one mesh deposited on the cathode layer, wherein the at least one mesh is screen-printed on the cathode layer and has a thickness in the range of about 20-100 microns.

Goodenough discloses a platinum mesh with platinum leads and an electrode paste being screen-printed on top of each electrode to act as a current collector over an effective area of 2.5 cm^2 (column 3 lines 32-43). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use a mesh screen- printed on to the cathode layer of Dodge and Singh et al., because Goodenough teaches mesh being able to achieve good contact the electrode (column 3, line 43). Goodenough does not disclose the thickness of the collector, but does disclose the effective area of the collector and thickness of the electrolyte. Therefore, it would have been within the skill of the ordinary artisan to adjust the thickness of the collector as long as the mechanical strength requirements can be met. Discovery of an optimum value of a result effective variable involves only routine skill in the art. MPEP 2144.05.

Response to Arguments

10. Applicant's arguments filed October 23, 2008, have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) Applicant submits that, "the Office apparently has misunderstood the structural features derived from an "embedded" anode side current collector derived from the "preformed" tubular structure because the Office has, apparently, misunderstood the term "green" as used by those of skill in the art of ceramics".

(b) Applicants submit that "Dodge discloses a hydrogen fuel cell, not a solid oxide fuel cell" and "Dodge would not function with a solid oxide electrolyte".

(c) Applicants submit that "Singh does not remedy the defects of Dodge" because " the very structure of Singh is different in, at least, requiring a non-functional support tube, a cathode where the instant anode side-current collector/anode is found in the present invention and an anode and anode current collector where the cathode is found in the present invention. Thus, Singh does not teach all the elements of the present claim, nor could Singh be modified to do so, as Singh requires, at least, a non-operational tube functioning only as a mechanical support". Applicants also submit that "the combination of Dodge and Singh does not yield the present invention and the Office has failed to make a prima facie case of obviousness".

(d) Applicants submit that "Isenberg does not remedy the defects of Dodge and Singh". Applicants assert that Isenberg does not teach a tubular solid oxide fuel cell and is incompatible with Dodge as neither apparatus would be functional at the operating temperature of the other.

(e) Applicants submit that "Sammes does not remedy the defects of Dodge and Singh".

(f) Applicants submit that "Goodenough does not cure the defects of Dodge and Singh".

In response to Applicant's arguments, please consider the following comments:

(a) The Examiner has considered the definitions submitted by Applicant on page 7 of the Remarks for the terms "green" and "sinter". Examiner has also taken in to consideration the terms "embedded" and "preformed" when examining the claim limitations. However, the corresponding arguments are not persuasive and the rejection above is maintained. The structural features of the tubular solid oxide fuel cell presented by the combination of the Dodge and Singh references, teach the same structure as that which is being claimed.

(b) With regard to the arguments that Dodge discloses a hydrogen fuel cell, not a solid oxide fuel cell and "Dodge would not function with a solid oxide electrolyte", it is noted that the rejection is based on Dodge (WO 96/04690) in view of Singh et al. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are

based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As Applicants discuss on pages 8-9 of the Remarks, there are at least nine major types of fuel cells. Each type of fuel cell produces electricity from fuel (catalytically reacted on the anode side) and an oxidant (catalytically reacted on the cathode side), which form reaction products in the presence of an electrolyte. The reactants flow into the cell, while electricity and the reaction products flow out of it. When an H_2 molecule comes in to contact with the catalyst on the anode side, it splits into two H^+ ions and two electrons (e^-). On the cathode side of the fuel cell, oxygen gas (O_2) reacts at the catalyst to it form oxygen ions. The two H^+ ions combine with an oxygen ion and two of the electrons from the external circuit to form a water molecule (H_2O). The electrolyte separates the catalytic electrodes within the fuel cell and transfers ions between electrodes. The difference between a polymer electrolyte fuel cell and a solid oxide fuel cell is the type of electrolyte present, as well as the migration of ions through the electrolyte. In a PEM, hydrogen ions are transferred through the electrolyte. In a solid oxide fuel cell, oxygen ions are transferred through the fuel cell. Therefore, while Dodge is a tubular polymer electrolyte fuel cell, it is relied upon to show that the prior art teaches the tubular fuel cell structural elements required by the claim limitations. Further, it would have been obvious to combine the structural features taught by Dodge with the solid oxide fuel cell electrolyte of Singh since the same elements, as noted above, will react to produce electrons. Catalyzing electrodes, fuel and oxidant are necessarily present

in both fuel cell types. Because these necessary structural elements are present, the fuel cell will function using each electrolyte under the proper conditions. Therefore, in response to applicants' arguments, the fuel cell of Dodge would function with a solid oxide electrolyte. Hydrogen and oxygen would be catalyzed. Electricity would be produced and oxygen ions would be transferred through the electrolyte. One skilled in the art would be motivated to use fuel cell structure taught by the teachings of Dodge with the elements of a solid oxide fuel cell as taught by Singh in order to provide a solid oxide fuel cell with the tubular structure taught in the prior art.

(c) In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As stated in the rejection above, the arrangement of the solid oxide fuel cell of Singh et al. has been reversed into an inverted cell structure as taught in the fuel cell of Dodge. The components are the same. The electrodes are on the opposite sides of the electrolyte and perform the same function even in the reverse positions. The anode functions as an anode that reacts with fuel. The cathode functions as a cathode that reacts with an oxidant. Based on the teachings of the prior art, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a nickel metallic structure as the anode side current collector of

the tubular fuel cell of Dodge, because Singh et al. teaches a nickel porous felt enhances electrical connections between fuel cells.

(d) Again, it is noted that in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. The rejection, as well as the response to arguments presented in (b) above, each discloses the structural features of the fuel cells relied upon to reject the claim limitations. The combination of the Dodge and Singh references teaches all of the claimed limitations noted and Isenberg teaches a known cathode configuration.

(e) The rejection and the response to arguments presented in (b) above each disclose the structural features of the fuel cells relied upon to reject the claims. The combination of the Dodge and Singh references teaches all of the claim limitations noted and Sammes teaches a known cathode material.

(f) The rejection above, as well as the response to arguments presented in (b) above, each discloses the structural features of the fuel cells relied upon to reject the claims. The combination of the Dodge and Singh references teach all of the claim limitations noted and Goodenough teaches a known cathode collector material and configuration.

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571)272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Ruthkosky/
Primary Examiner, Art Unit 1795

Karie O'Neill
Examiner
Art Unit 1795

KAO